

2001 Defense Standardization Program Award



Joint Tactical Radio System (JTRS)



**JTRS Briefing to
Industry
26 February
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**<http://jtrs.army.mil>
703-588-1056**

**JTRS
Joint Program
Office**

**Col Steven A. MacLaird,
USAF
Program Director
COL Glen D. Lambkin,**



Software Communications Architecture (SCA) Current Status & Future Evolution



Briefing Objectives

- Brief Current SCA Status
 - Describe Process for CPs and APIs
 - Announce Planned Version Update
- Describe JTRS JPO Strategy for the SCA
 - Standardize SCA, On-going Efforts at OMG
 - Evolve SCA With New Features, Current Focus
 - Maintain SCA, Clarifications & Corrections
- Elicit Industry Input for Evolving the SCA



Goals and Purpose of the SCA

- **The Goals Set for the JTRS Program Are:**

- Greatly Increased **Operational Flexibility** and **Interoperability** of Globally Deployed Systems,
- Reduced Supportability Costs,
- Upgradeability in Terms of Easy **Technology Insertion** and Capability Upgrades, and
- Reduced System Acquisition and Operation **Cost**.

- **In Order to Achieve These Goals, the SCA Has Been Structured To:**

- Provide for **Portability** of Applications Software Between Different SCA Implementations
- Leverage **Commercial Standards** to Reduce Development Cost
- Reduce Development Time of New Waveforms Through the Ability to **Reuse Design Modules**, and
- Build on Evolving **Commercial Frameworks and Architectures**.

Training and SCA Advocacy Are Key to Long-term
Success



SCA Committed to Open Standardization

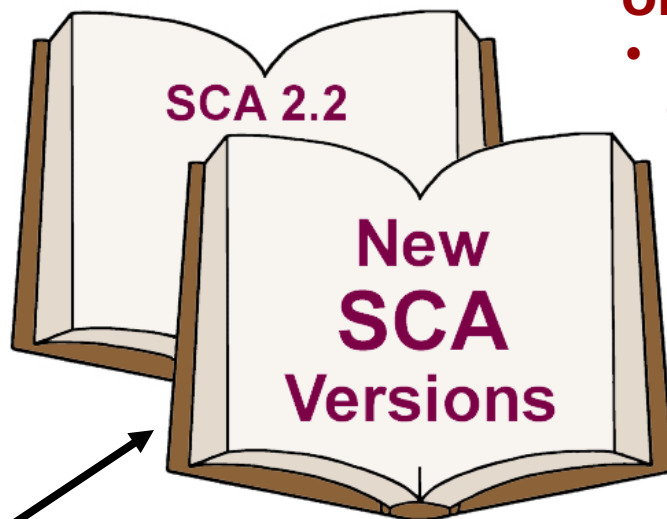


**Industry Experts
Developed SCA**

**JTRS CCB Releases
New SCA Versions**



**Recommends
Changes to
CCB**



- **SCA exposed to Industry at
OMG**
- **OMG Specifications then
considered for SCA inclusion**



**At-Large Users
May Submit SCA
Change Proposals
&
Standardize APIs**



**Technical Architecture
Group (TAG) Industry
Experts**

- **Analyze Change Proposals**
- **Reviews OMG Specifications**



Planned Update to SCA 2.2.1

- **Change Proposal Status Can Be Tracked on JTRS Website**

- CPs Are Categorized (e.g., Clarification, Security)
- Comments Are Open
- TAG Deliberations May Be Viewed

- **Currently 62 CPs With TAG Recommendations**

CP Category	# ¹
No Change	19
Clarification	43
Expedited	0
New Features	0

¹Preliminary Count

- Primarily Clarifications and Improvements to Text
- TAG Has Recommended Some CPs Not Be Approved
- TAG Recommends Incorporating Lightweight Log Service (OMG)
- TAG Reviews All CPs for Backwards Compatibility and for Impact to Compliance Test Tools



SCA Test Tools

- Configuration Control Board Activities
 - Board Consists of PM Representatives & JTRS JPO
 - Kickoff CCB Meeting Was Held 10 February
 - CCB Decisions on Cps Scheduled for 9 March Meeting
- Expect Publishing of SCA 2.2.1 This Spring
- SCA 2.2.1 Will Be Applied:
 - To New Acquisitions by Policy
 - To Existing Acquisitions on a Case by Case Basis
- Compliance Test Tools Status and Updates
 - Current Versions of Test Tools Have Been Distributed to Developers
 - JTAP V2.3.1 to Test SCA Core Frameworks
 - WTT V2.1.3 to Test SCA Compliant Waveforms
 - Tools Are Designed to Support Multiple SCA Versions Via Test Selections
 - Feedback on Test Tools Is Requested Via JTeL Portal
(<https://jtel.spawar.navy.mil/main.asp>)
- Each Product PM Negotiates the Version of Test Tools to Be Used for SCA Compliance (Sometime After CDR)



OMG Activities

- JTRS JPO Has Been Actively Participating in the OMG Software Radio DSIG
- JTRS JPO Leadership Has Developed a Relationship With OMG Management
- OMG Has Developed 5 SCA-based Specifications
 - Lightweight Log Services Finalized
 - Lightweight Services Adopted
 - Deployment & Configuration Adopted
 - Lightweight CCM Adopted
 - SW Radio Draft
- JTRS JPO Will Update the SCA to Reference the OMG Standards Based on TAG Recommendations
- SCA Evolves to Include Improved OMG Standards
- SCA Evolves to Include OMG Technology Improvements in Middleware (e.g., Real-time)



API Website and Registration

- Standardizing APIs Will Promote **Reuse** and Improve **Portability**
- JTRS JPO Has Established an API Website Reachable Through the SCA Change Proposal Portal off the JTRS Home Page (<https://jtrs.army.mil>)
 - 35 APIs Are Available for Posting
 - Awaiting Legal Approval for Release
 - Initial Focus Is on Service & Device APIs
- API Standardization Will Be Difficult & Industry Participation Is Essential
 - Identification of Appropriate APIs
 - Participation in Website Discussions
 - Evolving Requirements for API Documentation
- API Website Process
 - Acquisitions Submit APIs(Forums, Companies, Persons As Well)
 - APIs Are Matured Via Comment and Discussion on API Website
 - When Mature, APIs Are Reviewed by TAG for Compliance
 - CCB “**Registers**” APIs Recommended by the TAG
 - Subsequent Acquisitions Are Required to Use **Registered APIs**



Long Term SCA Evolution

- JTRS JPO Strategy for SCA Evolution
 - Maintain SCA – Corrections, Clarifications, User Requests
 - Evolve SCA – New Features, Expansions, Improved Standards
 - Standardize SCA – OMG, Education, Advocacy
- Reasons Driving the Need for SCA Enhancements
 - >2GHz Waveforms
 - Waveform Portability
 - Complexity of New Waveforms (WNW As It Evolves)



Long Term SCA Evolution continued

- JTRS JPO Has Identified 3 SCA Areas for Initial Focus:
 - Portability of FPGA & DSP Code
 - Study FPGA Porting Process
 - Review Existing Approaches (MHAL, RDL)
 - Consider Hardware Constraints
 - Performance Enhancement
 - Promote Real-time CORBA Evolution at OMG
 - Promote ORB Optimizations & Improved Transfer Methods
 - Evaluate Extension to JAVA & IDL Optimization
 - Evaluate New Hardware Technology and Architectures



Long Term SCA Evolution continued

- Tools for Building Components (Profiles)
 - Visualization / Manipulation of XML Components
 - Combining / Segmenting Components
 - Coordinating XML Profiles and Documentation
- JTRS JPO Solicits Industry Recommendations on the Direction of SCA Evolutions
 - We Are Planning SCA Workshops
 - We Will Consider Studies and White Papers



JTRS Program Configuration Management

- Configuration Management Is a Process for Establishing and Maintaining the Consistency of a Product's Performance, Functional and Physical Attributes With Its Requirements, Design and Operational Information Throughout Its Life Cycle
- Delineate Configuration Management Activities and Responsibilities Between the JTRS JPO and the Clusters (Capstone CM Plan)
- Coordinate the Activities of the Planned Joint Configuration Management Integrated Product Team (CM-IPT)
- Coordinate and Support the Activities of the JPO Configuration Change Board (JPO CCB), Which Will Approve All Changes to JPO Products



JTRS Program Configuration Management continued

- Manage Change Proposals (CPs) for the Software Communication Architecture (SCA) Documents and Its Associated Application Program Interfaces (APIs) Through the SCA Change Portal and JPO CCB to the Updating of Affected Documents
- Manage the Base Waveform Change Proposals Through the JPO CCB to the Appropriate Contract Vehicle (In Process)
- CM Is Basically a Gatekeeper to Make Sure That JPO-responsible Artifacts Are Protected and All Changes Are Documented and Approved Through a Consistent Process



JTRS JPO Configuration Items

- Software Communications Architecture (SCA)
 - The Basic Architecture Specification to Define the SCA Operating Environment and Specifies the Service and Interfaces That Applications Use From That Environment
 - The SCA Defines the Hardware and Software at Different Levels of Detail to Allow the Broadest Reusability and Portability of Components
- SCA Application Program Interfaces (APIs)
 - The SCA Annex Details and Requirements for Standard Application Program Interfaces to Be Used by SCA Applications to Permit and Encourage Portability of Software Components
- SCA Security Requirements
 - The SCA Annex Delineates the Government Security Requirements for JTRS and Provides the Security Requirements at an Architectural Level to Build a JTRS Radio
 - The Security Supplement Highlights the Various Functional Requirements That Security Will Need to Provide When Within a JTRS Radio and Delineates the Security Application Program Interfaces (APIs) Required for a JTRS-compatible Security Implementation



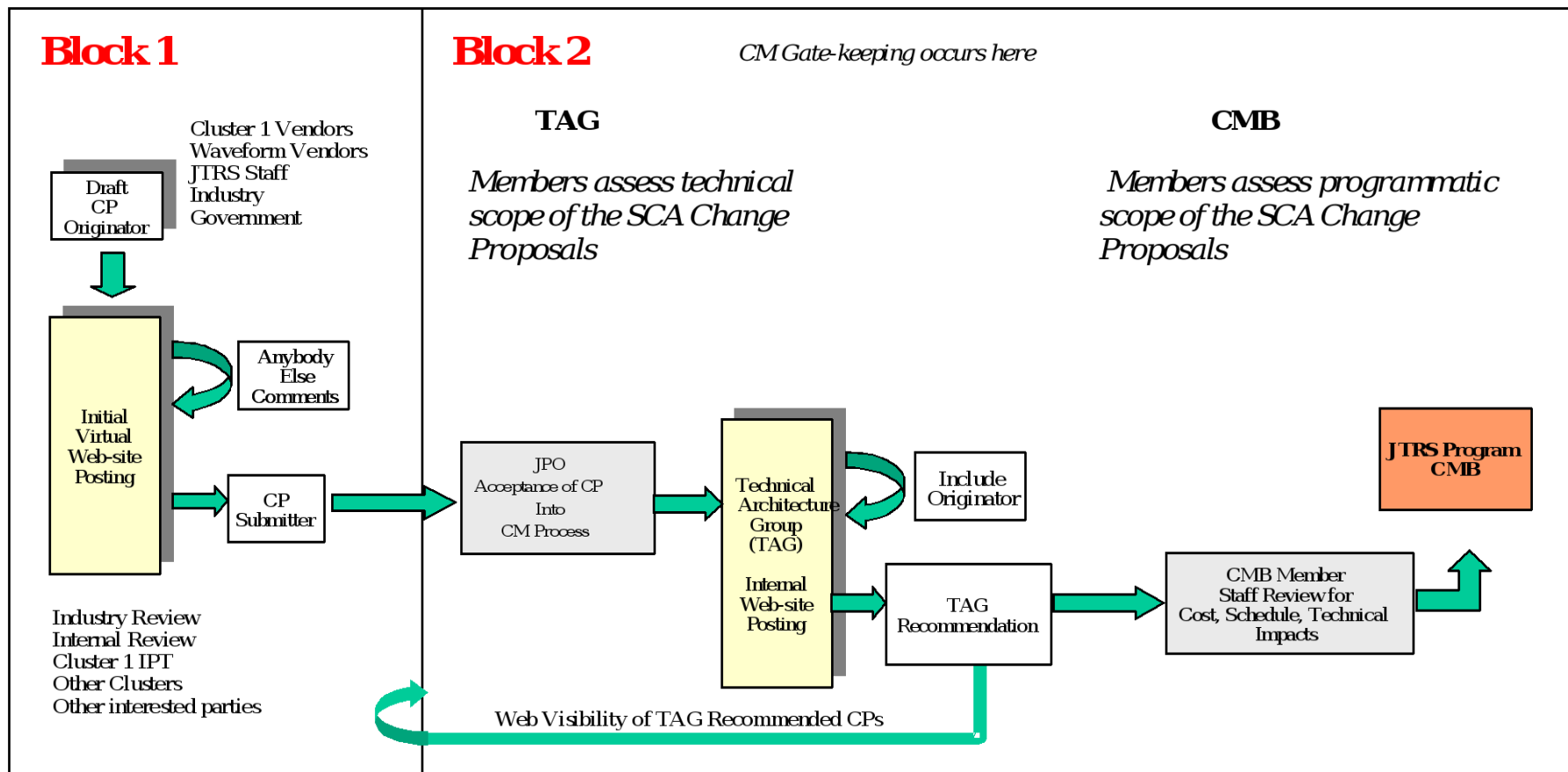
JTRS JPO Configuration Items

continued

- JTRS Base Waveforms
 - JTRS ORD (Operations Requirements Document) Waveform Software Applications That Have Been Verified Through the JTRS Technology Laboratory (JTeL) for Standards Compliance, Interoperability, and Security Requirements
- Cryptographic Equipment Applications (CEAs)
 - Software Applications Written for a Specific High-assurance Programmable Cryptographic Module
 - A CEA Uses the Cryptographic Algorithm Capabilities (Hardware and Software) Provided by the Cryptographic Module to Meet the Needs of One or More JTRS Waveforms
 - A Single CEA May Emulate Specific Modes of Legacy Cryptographic Equipment; Other CEAs Will Emulate Modernized Cryptographic Equipment or Be Designed to Meet New Requirements



SCA Change Control Process



- Process is defined on the SCA web-site at <http://jtrs.army.mil/>
- Process is built into SCA web-site functionality